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In Search of Pirate's Treasure: The Control and Ownership of Genetic Resource in the Mesoamerican Barrier Reef System

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I. INTRODUCTION

> Silver hobbled, grunting, on his crutch . . . and, from time to time, turned his eyes upon me with a deadly look. Certainly he took no pains to hide his thoughts; and certainly I read them like print. In the immediate nearness of the gold, all else had been forgotten; his promises and the doctor's warnings were both things of the past; and I could not doubt that he hoped to seize upon the treasure, find and board the *Hispaniola* under cover of night, cut every honest throat about that island, and sail away as he had at first intended, laden with crimes and riches . . . .

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- Treasure Island[1]

Historically, the islands of the Caribbean and their surrounding coral reefs have often been seen as places of mystery and romance, possessing almost mythical natural beauty; the types of places where adventurers and explorers would perform daring deeds in the pursuit of fame and untold riches. Today, the world is very different from the one where swashbucklers sailed the high seas and the people of the region with their rich coastal ecosystems have had to learn to live in a global, technology driven world. However, history has a remarkable tendency to repeat itself, and once again, on the coral reefs of the Caribbean, amazing unknown riches await those dedicated and lucky enough to search them out and those daring or despicable enough to take them.

As a general matter, coral reefs such as those found off the Caribbean coasts of much of Central America, are unique marine ecosystems that are found in shallow waters in warm or tropical parts of the world.[2] Coral reefs are also incredibly diverse and productive habitats.[3] While reefs occupy only a small portion of the ocean, it is estimated that they support millions of species of plants and animals.[4] This treasure trove of biodiversity includes not only species that are valuable for food and recreation, but also marine plants and animals that produce compounds with antiviral, anti-bacterial and related properties.[5] In fact, coral reef ecosystems in Jamaica are reported to produce pharmaceutical materials worth fifty-four to eighty-five million dollars per year.[6]

The Mesoamerican Barrier Reef System (MBRS) is a complex of reef ecosystems that stretches from southern Mexico to Honduras,[7] and comprises "the second longest barrier reef in the world."[8] The MBRS is unlike most other reef systems, due to its immense size, complexity and outstanding biological diversity.[9] It acts as an important habitat and breeding ground for a host of marine

1. R.L. STEVENSON, TREASURE ISLAND 271 (Charles Scribner's Sons 1905) (1883).

2. *See generally* Robin Kundis Craig, *Taking Steps toward Marine Wilderness Protection? Fishing and Coral Reef Marine Reserves in Florida and Hawaii,* 34 MCGEORGE L. REV. 155, 183-84 (2003) (discussing general concepts of coral reef habitat and value).

3. *Id.* at 184-85.

4. *Id.* at 184.

5. *Id.* at 185 (citing H.R. REP. NO. 105-69, at 2 (1997)).

6. *Id.*

7. MESOAMERICAN BARRIER REEF SYSTEMS PROJECT, HOME PAGE, http://www.mbrs.org.bz/english/en_index.htm (last visited Jan. 20, 2006).

8. *Id.*

9. *Id.*

creatures, a number of which have significant economic value.[10] The MBRS also provides the livelihood for over a million people in the region by offering both food and a source of income for the local population.[11]

The importance of protecting this extended ecosystem has spawned the creation of the Project for the Conservation and Sustainable Use of the Mesoamerican Barrier Reef System (MBRP), a cooperative effort between the countries of Mexico, Belize, Guatemala and Honduras.[12] The stated overall purpose of the project is to "enhance protection of the unique and vulnerable marine ecosystems comprising the MBRS, and to assist the countries of Mexico, Belize, Guatemala and Honduras to strengthen and coordinate regional policies, regulations, and institutional arrangements for the conservation and sustainable use of this global public good."[13] The MBRP was created in June of 2001 in Belize, and was recognized by the World Bank in November of that year.[14] The MBRP has several regional objectives that the participating countries are pursuing, including:

> (a) [S]trengthen[ing] Marine Protected Areas; (b) develop[ing] and implement[ing] a standardized data management system of ecosystem monitoring and facilitat[ing] the dissemination of its outputs throughout the region; (c) promot[ing] measures which will serve to reduce non-sustainable patterns of economic exploitation of [MBRS] . . . ; (d) increas[ing] local and national capacity for environmental management through education, information sharing and training; and (e) facilitat[ing] the strengthening and coordinating of national policies, regulations, and institutional arrangements for marine ecosystem conservation and sustainable use.[15]

At the same time, recent advances in the field of genetics have ushered in a new age of biotechnology.[16] These new technologies

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10. *Id.*

11. *See id.*

12. MESOAMERICAN BARRIER REEF SYSTEMS PROJECT, PROJECT BACKGROUND, http://www.mbrs.org.bz/english/projdesc.htm (last visited Jan. 20, 2006).

13. MESOAMERICAN BARRIER REEF SYSTEMS PROJECT HOME PAGE, *supra* note 7.

14. MESOAMERICAN BARRIER REEF SYSTEMS PROJECT, PROJECT BACKGROUND, *supra* note 12.

15. *Id.*

16. *See generally* Chee Yoke Ling, *The Quest for Fair, Equitable and Sustainable Exchange and Benefit Sharing*, THIRD WORLD RESURGENCE, Jan./Feb. 2004, at 16, *available at* http://www.twnside.org.sg/title/cop7c.htm (discussing the relationship between biotechnology interests and the third world within the framework created by the CBD).

have led to a host of legal, environmental and political problems that international players such as the MBRP may have to resolve if they are to function as intended.[17] These include the ownership of genetic wealth, governing access to that wealth and the technologies needed to exploit it, and the competing rights of various groups that have a stake in genetic ownership.[18] These problems have taken shape during a time of increased interest in marine resources as a source of genetic raw materials needed for the production of drugs and other chemicals.[19] Diverse marine ecosystems such as the MBRS are generally thought to have a very high probability of producing such raw materials,[20] and based on its size and outstanding biodiversity, the MBRS is a potential gold mine of marine genetic resources.[21] A major problem for the countries of the MBRP, in their efforts to conserve and exploit these resources, is the relative lack of "predictable, fair, and effective international and domestic legal rules governing ownership of marine genetic resources."[22]

Ownership and control of the potential genetic wealth of such marine ecosystems is affected by several competing concerns. The first and most obvious is the United Nations Convention on the Law of the Sea (UNCLOS).[23] Second, but perhaps more direct, are the effects of the United Nations Convention on Biodiversity (CBD).[24] Finally, the effects of the intellectual property regimes realized under the General Agreement on Tariffs and Trade (GATT)[25] and the Agreement on Trade-Related Aspects of Intellec-

17. *See* GENERALLY RICHARD MCLAUGHLIN, MISSISSIPPI-ALABAMA SEA GRANT LEGAL PROGRAM, MANAGING ACCESS TO MARINE GENETIC RESOURCES IN BELIZE: COOPERATION RATHER THAN CAPTURE, http://www.olemiss.edu/orgs/SGLC/mclaughlinab.htm (last visited Nov. 10, 2005) (describing several problem areas in the management of internationally shared marine resources).

18. *See, e.g.,* Conference of the Parties to the Convention on Biological Diversity, Kuala Lumpar, Malaysia, Feb. 9-20 and 27, 2004, *Report of the Seventh Meeting of the Conference of the Parties of the Convention on Biological Diversity*, Decision VII/5, U.N. Doc. UNEP/CBD/COP/7/21 (April 13, 2004) [hereinafter COP]. Conference of the Parties decisions that span meetings three through seven continually touch on these matters. *Id.*

19. *See* MCLAUGHLIN, *supra* note 17.

20. *Id.*

21. *Id.*

22. *Id.*

23. *See* United Nations Convention on the Law of the Sea, Dec. 10, 1982, 1833 U.N.T.S. 397 [hereinafter UNCLOS].

24. *See* United Nations Convention on Biological Diversity, June 5, 1992, 1760 U.N.T.S. 79 (entered into force Dec. 29, 1993) [hereinafter CBD].

25. *See* General Agreement on Tariffs and Trade, Oct. 30, 1947, 61 Stat. A-11, 55 U.N.T.S. 194 [hereinafter GATT].

tual Property Rights (TRIPS)[26] are not insubstantial.

II. INTERNATIONAL AGREEMENTS

A. *United Nations Convention on the Law of the Sea (UNCLOS)*

UNCLOS came into force in November of 1994.[27] With over 150 participants, it has become a primary source of international law concerning a wide array of subjects dealing with the oceans and navigable waters worldwide.[28] As a major source of international law, UNCLOS attempts to resolve various issues of national sovereignty over the oceans and their recourses.[29] Through various UNCLOS actions, a framework of rights has evolved that clarifies national positions regarding ownership and control of coastal and offshore waters and their contents.[30] These rights include a territorial sea[31], an exclusive economic zone (EEZ)[32], and certain rights to exploit the continental shelf.[33]

Territorial sea provisions have the effect of making an area of ocean stretching from the coast to twelve nautical miles offshore, a part of the country's sovereign territory.[34] The coastal state has the right to claim exclusive control of this territorial sea and everything above or below it.[35] As a result, anything occurring naturally within such a claim is normally considered a possession of the coastal state.[36]

The EEZ provisions of UNCLOS allow a coastal state to claim an exclusive economic right to any marine resources that exist in an area extending 200 nautical miles offshore.[37] This allows

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26. *See* Agreement on Trade-Related Aspects of Intellectual Property Rights, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1C, Legal Instruments – Results of the Uruguay Round, 1869 U.N.T.S. 299 [hereinafter TRIPS].

27. UNITED NATIONS DIVISION FOR OCEAN AFFAIRS AND THE LAW OF THE SEA, UNITED NATIONS CONVENTION ON THE LAW OF THE SEA OF 10 DECEMBER 1982 OVERVIEW AND FULL TEXT, http://www.un.org/depts/los/convention_agreements/convention_overview_convention.htm (last visited Feb. 7, 2006).

28. *Id.*

29. *See* UNCLOS, *supra* note 23, Preamble.

30. *Id.*

31. *Id.* art. 2.

32. *Id.* art. 55-75.

33. *Id.* art. 77.

34. *Id.* art. 2-16 (defining specific limitations to the territorial sea).

35. *Id.*

36. *Id.*

37. *Id.* arts. 56, 57.

coastal states to exploit marine resources found in the water column as well as the seabed and subsoil.[38]

The continental shelf regime is a body of international law that grants coastal states the power to control, with some limitations, the resources of the continental shelf as far as 350 nautical miles offshore.[39] This regime allows a state to utilize not only stationary resources of the continental shelf, but also living resources so long as they cannot effectively move without contacting the sea floor at specific times during their lifecycle.[40] The combination of these doctrines places control of shallow water benthic communities like reefs firmly in the jurisdiction of the coastal states around which they occur.[41] Unfortunately, UNCLOS appears primarily concerned with economic utilization of tangible marine resources such as fish stocks or mineral deposits.[42] While the Convention clearly states that marine resources of a coastal state fall within its zone, up to a distance of at least 200 nautical miles,[43] the Convention fails to deal in an adequate fashion with the notion of genetic resources, which are not always considered a tangible commodity in that sense.[44] Despite the Convention's lack of clarity regarding reef genetic resources, it can still be easily inferred that under the right to claim exclusive economic exploitation of an area, jurisdiction over such matters will rest with coastal states to deal with as they see fit, notwithstanding other international agreements or established international law.[45]

In light of this, countries of the MBRP have begun to designate marine protected areas in an effort to deal with the conservation and management of their marine resources.[46] For instance, at

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38. *Id.* art. 56.

39. *Id.* arts. 76-84 (providing specific limitations and conditions to a states control over the continental shelf).

40. *Id.* art. 77.

41. *Id.* arts. 2-16, 56, 57, 76-84.

42. *Id.*

43. *See id.* arts. 2-16, 33-36, 55-85.

44. *Id.*

45. *Id.*

46. *See* TOLEDO INSTITUTE FOR DEVELOPMENT AND ENVIRONMENT, PORT HONDURAS MARINE RESERVE ANNUAL REPORT 2003, *available at* http://www.tidebelize.org [hereinafter ANNUAL REPORT] (last visited Nov. 17, 2005) (follow "News & Events" hyperlink; then follow "Port Honduras Marine Reserve Annual Report 2003" hyperlink); *see also* MESOAMERICAN BARRIER REEF PROJECT, TRAINING MANUAL ON DESIGN AND DEVELOPMENT OF MANAGEMENT PLANS FOR MARINE PROTECTED AREAS, *available at* http://www.mbrs.org.bz/dbdocs/tech/MPAplan7.pdf [hereinafter TRAINING MANUAL] (last visited Nov. 17, 2005) (discussing general feasibility and procedures for implementing marine reserves in the Mesoamerican Barrier Reef System).

the Hol Chan Marine Reserve in Belize, management goals include the maintenance of a cross section of coral reef ecosystem in its natural state[47]. This is being done in an effort to provide both educational and tourism based opportunities for Belize, as well as to preserve the value of the area as a source of genetic research.[48] Likewise, interests in Honduras have instituted a marine reserve known as the Port Honduras Marine Reserve (PHMR).[49] The PHMR strategy is comprised of several broad goals:

1. To protect the physical and biological resources of Port Honduras,
2. To provide education and research,
3. To preserve the value of the area for fisheries and other important genetic resources,
4. To develop recreational and tourism services that will enhance the economic and social benefits of the area without causing environmental damage, and
5. To strive for sustainable financing.[50]

While these are important goals for the marine reserves of the MBRP, the lack of specific treatment for genetic resources under UNCLOS leaves their effectiveness as a tool for the management of that particular type of resource somewhat in question.[51]

B. United Nations Convention on Biodiversity (CBD)

The underlying importance of UNCLOS notwithstanding, the ability of MBRP countries to exercise control over their genetic resources is heavily reliant on the CBD, which was introduced on June 5, 1992 at the "Earth Summit" in Rio de Janeiro.[52] The following summer, the United States signed the Convention despite initial objections to various economic and intellectual property provisions that it contained.[53] The Convention does not acquire force of law in the United States until the Senate ratifies it how-

47. TRAINING MANUAL, *supra* note 46, at 23.

48. *Id.*

49. *See* TOLEDO INSTITUTE FOR DEVELOPMENT AND ENVIRONMENT, Port Honduras Marine Reserve (PHMR), http://www.tidebelize.org (last visited March 14, 2006) (follow "Programs" hyperlink; then follow "Protected Areas" hyperlink; then follow "Port Honduras Marine Reserve" hyperlink).

50. *Id.*

51. *See generally* UNCLOS, *supra* note 23.

52. Daniel T. Jenks, *The Convention on Biological Diversity - An Efficient Framework for the Preservation of Life on Earth?*, 15 NW. J. INT'L. L. & BUS. 636, 636 (1995); *see also* CBD, *supra* note 24.

53. Edgar J. Asebey & Jill D. Kempenaar, *Biodiversity Prospecting: Fulfilling the Mandate of the Biodiversity Convention,* 28 VAND. J. TRANSNAT'L L. 703, 713 (1995).

ever, and it has yet to do so.[54]

The CBD's primary objectives include the conservation of biological diversity, the sustainable use of that diversity and the fair and equitable sharing of benefits derived from that use.[55] The provisions dealing with access to genetic resources in the possession of a state, such as those found in reef systems can be found in Article 15.[56] This portion of the Convention recognizes several principles.[57] These include recognition of sovereign rights over biological resources in State possession; facilitation of access to genetic resources for environmentally sound uses subject to prior informed consent; and the fair and equitable sharing of the results of research and development arising from commercial or other use of genetic resources.[58]

In effect, the Convention calls for a great deal of exchange between the developed northern countries of the world and the resource rich southern ones.[59] This exchange is designed to allow access to the world's biological riches for the North, and the economic and social enrichment for the South.[60] The CBD achieves this through the recognition of a sovereign property right in genetic material found within state borders.[61] Genetic material is defined as "any material of plant, animal, microbial or other origin containing functioning units of heredity."[62] By granting this right, the Convention allows developing nations to realize the benefits of preserving biodiversity, which previously had been difficult for them to capture.[63]

The CBD mandates that in exchange for access to a State's genetic resources, the source country is to receive active support for conservation efforts in that nation, compensation for its resources, and technologies to assist it in expanding its capacity to exploit those resources.[64] These requirements are particularly rel-

54. *See* Status of Multilateral Treaties Deposited with the Secretary-General, http://untreaty.un.org/ENGLISH/bible/englishinternetbible/bible.asp (last visited Feb. 11, 2006) (follow "Chapter XXVII Environment" hyperlink; then follow "8. Convention on Biological Diversity" hyperlink).

55. *See* CBD, *supra* note 24, art. 1.

56. *See id.* art. 15.

57. *See id.*

58. Ling, *supra* note 16.

59. Asebey & Kempenaar, *supra* note 53, at 714-15.

60. *Id.*

61. Jenks, *supra* note 52, at 637.

62. *Id.*

63. *Id.* at 650.

64. Asebey & Kempenaar, *supra* note 53, at 704-05.

evant because they directly affect genetic harvesting efforts and ultimately, the control and ownership of genetic material.[65]

The Convention uses several strategies to achieve these goals. For instance, the CBD mandates that a multilateral fund be created to support projects for conservation in the South. These projects would be primarily funded by the North, in theory to defend their interests in supporting the biodiversity of the planet.[66] The Convention also ties access to genetic resources to equitable benefit sharing.[67] "Article 19 explicitly states the developing world's expectation that, in exchange for access to its biodiversity, it will receive a fair and equitable portion of the benefits that the North derives from the use of the South's genetic resources."[68] Furthermore, Article 15 of the Convention includes language that reinforces the notion of a states complete control over its resources.[69] These provisions allow developing countries to receive benefits from the commercialization of biological resources, and provide an opportunity for economic development without resorting to destructive types of exploitation in what are extraordinarily valuable ecosystems.[70]

The CBD deals with the issue of technology transfer in Article 16.[71] This article establishes an investment requirement in new technologies in exchange for access to genetic resources in much the same spirit as Article 15.[72] Unfortunately, this has been a significant sticking point between the South and the North as they have attempted to negotiate within the framework of the Convention.[73]

The CBD has broken new ground of a sort with its position on the ownership of genetic materials,[74] and the world continues to debate the appropriate mechanisms necessary to make it function as intended.[75] Commentators have applied numerous postulations

65. *Id.* at 714.
66. Jenks, *supra* note 52, at 637.
67. *See* CBD, *supra* note 24, art. 19.
68. Asebey & Kempenaar, *supra* note 53, at 715; *see also* CBD, *supra* note 24, art. 19.
69. Asebey & Kempenaar, *supra* note 53, at 715; *see also* CBD, *supra* note 24, art. 15.
70. *See* Jenks, *supra* note 52, at 650.
71. Asebey & Kempenaar, *supra* note 53, at 714; *see also* CBD, *supra* note 24, art. 16.
72. Asebey & Kempenaar, *supra* note 53, at 714-15; *see also* CBD, *supra* note 24, arts. 15-16.
73. Asebey & Kempenaar, *supra* note 53, at 716.
74. *See* Jenks, *supra* note 52, at 640.
75. *Id.*

as to how such a system could work.[76] Unfortunately, it seems apparent that none have yet proven acceptable to the international community, as witnessed by the lack of decisive action by the Conference of Parties to the Convention on Biological Diversity (COP), the main administrative body of the Convention.[77]

While it is still uncertain to exactly what degree property rights are recognized by the CBD, certain basic rights in property can be identified.[78] These include the right of nations to control physical access to the ecosystems in question, and the right to negotiate on equitable terms for that access.[79] Paragraph 1 of the Convention recognizes the right to "'determine access to genetic resources' and Article 15, paragraphs 4, 5 and 7 require that access shall be given 'upon mutually agreed upon terms,' 'based upon prior informed consent' and with benefits of biodiversity shared in a 'fair and equitable way.'"[80]

The CBD has also caused some headaches for the international community. One issue that has been discussed at great length is the fact that the Conventions' wording is too vague and superficial.[81] While international agreements usually include broad wording, the use of terms such as "endeavor to" do not typically make good black letter provisions.[82] The *Vanderbilt Journal of Transnational Law* reports that "[b]ecause international agreements require consensus among many nations, they 'tend to reflect the lowest common denominator' rather than the majority standard."[83] Despite this concern, it is important to note the strengths of the Convention and its overall equitable goals. Prior to the adoption of the Convention, enforcement of sovereignty over natural resources was an internal matter for developing nations, many of which were ill-equipped to deal with the problem.[84] The arrival of the CBD "marks a dramatic shift from unfair exploitation (even theft) to a legally binding system of exchange."[85]

How the world community interprets these rights over the genetic material as outlined in the CBD, and how countries then

76. *Id.*

77. *Id.*; *see also* COP, *supra* note 18. Discussion of similar issues that do little more than resolve to work on the problem can be found within COP Decisions VII/1-7.

78. Jenks, *supra* note 52, at 642.

79. *Id.*

80. *Id.* (quoting CBD, *supra* note 24, art. 15).

81. *See* Asebey & Kempenaar, *supra* note 53, at 716-17.

82. *Id.*

83. *Id.*

84. Ling, *supra* note 16.

85. *Id.*

interact with one another regarding the issue will have profound effects on the success of the Convention.[86] The CBD states that access to biodiversity must be granted for biologically friendly research purposes so long as a country is informed of the research and gives its informed consent.[87] Yet as discussed above, nations are permitted complete control over their resources through the CBD and UNCLOS.[88] This raises some questions. For instance, how are countries to deal with one another in regard to benign use of biological resources? Are there in fact purely benign uses of biological resources? Under what circumstances may a country deny access? If an ecosystem crosses national boundaries, who owns the right to exploit the genetic material of that ecosystem? These questions have enormous potential impact, because once genetic material is harvested in one state, it can potentially lose much of its property value in neighboring states that have yet to exploit the resource.[89] This inconsistency may have immense ramifications for the MBRP. For instance, must the rights to the genetic resources of the MBRS and their benefits be completely communal to all four countries? Furthermore, how should benefits arising from these resources be divided? These questions seem to set the debate apart from discussions based on other property rights such as common oil or gas pools.[90] If one collects from such a pool, the value of the remaining commodity will not have lost its value. However, in the case of genetic resources, which have a tendency to be ultimately influenced by intellectual property law, allowing access to the resource may significantly undermine its future value to others whom may also possess it within the MBRP.[91] This could potentially create substantial conflict between signatory nations over control of these common marine resources and could also undermine the MBRP and affect the functioning of the CBD itself.[92]

86. Jenks, *supra* note 52, at 651.

87. CBD, *supra* note 24, art. 15.

88. *Id.*; *See also* UNCLOS, *supra* note 23, arts. 3-16, 56, 57, 77-84.

89. Jenks, *supra* note 52, at 651.

90. *See generally* McLAUGHLIN, *supra* note 17 (outlining differences between genetic and customary natural resource management through abstract and slide show).

91. *Id.*

92. *Id.*

C. *Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS)*

An important aspect of the ownership of genetic resources can also be seen it the interaction of the CBD and the TRIPS agreement. TRIPS has become a dominant force in international intellectual property law.[93] As part of GATT, the agreement governs several different types of subject matter including patents, trademarks, copyrights, and trade secrets.[94] Several aspects of TRIPS have received increased scrutiny in recent years for their potential as both possible solutions and impediments to the goals of the CBD.[95] Of these areas, it is patent provisions that seem to cause the most controversy.[96]

The Uruguay Round of GATT is the most recent effort to formalize an international intellectual property law system capable of addressing the ownership of genetic resources.[97] Unfortunately, disagreement remains high. Developing countries assert that patents on biotechnology impede benefit sharing and ultimately conservation.[98] On the other hand, developed countries assert that such patent rights promote innovation and economic development and will have the effect of actually promoting conservation as the commercial value of genetic resources increases.[99]

Under current patent rules, a naturally occurring substance cannot be patented, as it is a discovery, not an invention.[100] However, "where a substance, 'previously unknown in its purified and isolated form,' is refined so that the product can be distinguished in kind, and where it also demonstrates 'unexpected properties,' the refined substance is patentable."[101] Developing countries are highly critical of a system that gives patent protection only to entities that are technically and financially capable of isolating and purifying a substance that already occurs in nature.[102] As a result, intellectual property regimes governing control over genetic

93. Kamil Idris, *Intellectual Property Plays Key Role in Wealth Creation, Social Well-Being,* KOREA HERALD, May 19, 2004, *available at* LexisNexis Academic (discussing the importance of a strong worldwide intellectual property system).

94. *See* TRIPS, *supra* note 26.

95. Asebey & Kempenaar, *supra* note 53, at 710-11.

96. *Id.*

97. *See* GATT, *supra* note 25 (showing that the Uruguay round has produced much of the TRIPS agreement).

98. Asebey & Kempenaar, *supra* note 53, at 710.

99. *Id.*

100. *Id.* at 711.

101. *Id.* (internal citations omitted).

102. *Id.*

resources have been, and continue to be a major source of contention.[103]

Another effect of the CBD on intellectual property concerns arises in the area of benefit sharing and the ideal of prior informed consent.[104] The need for such consent has given rise to various contractual arrangements as possible deterrents to outsiders simply collecting genetic samples without permission, based on the notion that such material is the common heritage of man and available to all.[105] There seem to be few options available to deal with unfair agreements that may arise under the system however.[106] The impact of the debate on the MBRP could of course be significant. The notion that genetic material found in the wild could be taken freely under the common heritage doctrine and then be subsequently patented could greatly undermine the economic value of the reef, and ultimately undermine conservation initiatives of participating countries.[107] At present, the debate rages on as to whether TRIPS should be altered in order to address such concerns.[108] For instance, the World Intellectual Property Organization (WIPO) is now actively involved in the search for solutions to some of these problems.[109] The organization feels that a strong intellectual property system is critical for the fostering of economic development in less developed nations, and the WIPO approach is grounded on the theory that nations can utilize intellectual property protections as a type of economic capital.[110] The source of much of the international disagreement on the issue does not appear to be the result of such philosophical differences of opinion, but more so the result of competition for influence between the CBD and what is considered to be the more powerful TRIPS agreement, and the fact that such conflicts exist

103. *Id.* at 712.

104. *See* CBD, *supra* note 24, art. 15; *see generally* TRIPS, *supra* note 26 (providing basic structure of intellectual property system).

105. *See* INTERNATIONAL NETWORK FOR ENVIRONMENTAL COMPLIANCE AND ENFORCEMENT, FIELD TRIP BACKGROUND INFORMATION: NATIONAL BIODIVERSITY INSTITUTE: CREATING SCIENTIFIC, COMMUNITY AND MARKET VALUE FROM BIODIVERSITY (April 17, 2002) http://www.inece.org/conf/fieldtripsbiodiversity.html (last visited July 16, 2004) (outlining basic principles of the heritage doctrine as it relates to genetic resources).

106. *See* Asebey & Kempenaar, *supra* note 53, at 717 (finding that the CBD contains no criteria for fairness and does not address the issue of disparate bargaining power).

107. *Id.*

108. *See* Idris, *supra* note 93.

109. *See id.*

110. *See id.*

between international agreements that both purport to be binding to some degree.[111] The CBD takes the general view that if a product or process has existed in nature or has been known by a culture, it is owned by the local community or state in which it occurs.[112] As such, those resources would be protected under intellectual property law.[113] On the other hand, TRIPS maintains that if it is not patented it cannot be owned, and thus, it represents knowledge that belongs to everyone and is free for exploitation by all.[114] Again, however, consensus between the North and the South on these issues has been hard to come by.[115]

Informed consent will likely continue to play an important role in the interaction of the CBD and property rights as well. The Convention states that access to a nation's genetic resources must be dependent upon obtaining prior informed consent.[116] This requirement has obvious effects on the legitimate ownership of genetic resources. What informed consent actually means however is less than clear.[117] As a result, this issue has also been debated in lively fashion, and nations have interpreted the term in a number of ways.[118] Despite the host of possible types and levels of consent that a nation may require, any informed consent must take into account two major factors: 1) what information needs to be provided, and 2) what procedures should be used to implement the exchange.[119] Meanwhile, as these basic aspects are hammered out, various nations continue to complain of the implementation of genetic harvesting within their borders without the fully informed consent the CBD requires.[120] Meanwhile, those involved in gene harvesting point out the conspicuous absence of any real consensus on what prior informed consent actually entails.[121] Despite

111. *See* Gerard Bodeker, *Traditional Medical Knowledge, Intellectual Property Rights & Benefit Sharing*, 11 CARDOZO J. INT'L & COMP. L. 785, 790 (2003).

112. *Id.*

113. *Id.*

114. *Id.*

115. *See* Asebey & Kempenaar, *supra* note 53, at 712 (observing that there is significant disagreement between the North and South over biotechnology patents).

116. CBD, *supra* note 24, art. 15.

117. Laurel A. Firestone, *You Say Yes, I Say No; Defining Community Prior Informed Consent under the Convention on Biological Diversity*, 16 GEO. INT'L ENVTL. L. REV. 171, 183 (2003).

118. *Id.* at 184.

119. *Id.* at 185.

120. Bodeker, *supra* note 111, at 792.

121. *See* Charles R. McManis, *Intellectual Property, Genetic Resources and Traditional Knowledge Protection: Thinking Globally, Acting Locally*, 11 Cardozo J. Int'l & Comp. L. 547, 563 (2003).

these current shortfalls, it seems likely that the development of some type of concrete international policy dealing with consent issues would have a significant impact on the ownership and control of reef genetic resources in the MBRP.

In an effort to harmonize some of these problems, countries have begun to turn to legal instruments such as bioprospecting agreements to protect their rights under both the CBD and TRIPS.[122] The practice of searching ecosystems for harvestable genetic resources is known as biodiversity prospecting, or simply bioprospecting.[123] These activities include "the search for bioactive compounds contained in natural sources such as plants, fungi, insects, microbes, and marine organisms."[124] Such compounds are a natural starting point for chemical and drug discovery, and are inherently valuable as a result.[125] This causes bioprospecting to be attractive to many, and the process of developing genetic resources into marketable goods and the resultant monetary rewards appears to provide an incentive necessary to keep the practice a robust one.[126] Prior to the implementation of the CBD, such prospecting was simply something that occurred. When research materials were needed, a company went out and found them.[127] This approach allowed companies from the North to exploit, in what is often seen as a non-equitable fashion, the natural resources of many developing countries in the South.[128] With the entry into force of the CBD, this issue has received increasing scrutiny, and has developed into a focal point of sorts for friction between the two bodies of law. The benefits of bioprospecting are attractive to both sides of the debate however, primarily due to the economic rewards that both the producers and consumers of biological resources could potentially reap.[129] Development assistance agencies support bioprospecting as "a chance to promote . . . these goals at the same time, designing integrated conservation and development projects based on sustainable use of wild genetic

122. Asebey & Kempenaar, *supra* note 53, at 704.

123. *Id.* at 706.

124. *Id.*

125. *Id.*

126. *Id.*

127. *See* TERRY SUNDERLAND ET AL., BIOPROSPECTING: THE CASE OF BIORESOURCES DEVELOPMENT AND CONSERVATION PROGRAMME – CAMEROON (1997), http://www.earthwatch.org/site/pp.asp?c=CRLQK3PHLsF&b=480019 (describing the concept and importance of bioprospecting and bioprospecting agreements under section entitled "Concept and Importance of Bioprospecting").

128. *Id.*

129. *Id.*

resources by high-technology industry."[130] However, in order to realize these conservation goals of the CBD, bioprospecting will require the cooperation of producers and consumers in both the public and private sectors.[131]

When it comes to implementing the practice of bioprospecting in the developing world, most countries initially utilized a system of permits that allowed access by scientists or other interested parties to various ecosystems in order to collect samples.[132] This could often be done at the local level with little or no notification to the national government.[133] As a result, it has proven quite difficult for nations to monitor what is actually going on and what their genetic wealth is being used for.[134] This has led over time to the development of bioprospecting agreements or contracts as a method for control and compliance in the developing world.[135]

Bioprospecting agreements have been found to be effective instruments in the developed world as well. A U.S. Federal Court found such an agreement to be binding when it upheld a 1997 bioprospecting agreement between Diversa Corporation and Yellowstone National Park.[136] The agreement provided that Diversa would contribute specified economic and scientific benefits resulting from research activities within the Park in exchange for biodiversity access to environmental samples collected within Yellowstone.[137]

Situations in which bioprospecting could occur cover a wide range of circumstances and as a result, most projects vary in some way.[138] Consequently it is difficult to create a perfect template document that embodies all things to all parties. Much like the projects themselves, the agreements tend to vary widely, as they are the results of the needs and bargaining positions of the parties

130. *Id.*

131. *Id.*

132. *See id.* (discussing general concepts of the permit system in use in Cameroon under section entitled "Bioprospecting Contracts or Agreements").

133. *See generally* Pusch Commey, *The New Scramble for Africa: Biopiracy,* NEW AFRICAN, Dec. 1, 2003, at 12.

134. *Id.*

135. SUNDERLAND ET AL., *supra* note 127.

136. Edmonds Inst. v. Babbitt, 93 F. Supp. 2d 63 (D.D.C. 2000).

137. *Bioprospecting Agreement Upheld,* APPLIED GENETICS NEWS, May 2000, *available at* http://www.findarticles.com/p/articles/mi_m0DED/is_10_20/ai_62404390 (briefly discussing Diversa Corp.'s bioprospecting agreement).

138. SUNDERLAND ET AL., *supra* note 127 (noting that no two agreements or contracts are the same under section entitled "Critical Elements of a Biodiversity Prospecting Agreement or Contract").

involved.[139] Despite these inherent variations, all bioprospecting agreements should address several key elements in an effort to further the goals of the CBD.[140] These include ownership and control of genetic resources, compensation, technology transfer and the use of resultant knowledge.[141] Agreements of this kind should deal with issues of control and ownership of genetic resources both prior and subsequent to the agreement.[142] Conservation of genetic resource value should also be addressed.[143] This requires reasonable negotiations regarding limitations on the types of species collected, locations they can be collected from, and the number of specimens that may be collected.[144]

In order to combat what is often seen as a significant problem with informed consent, the scope of future use for a country's genetic resource should always be a term of the agreement.[145] This allows a source country to retain limited control over aspects of its genetic resources even after they have been removed from the country for an agreed upon purpose.[146] Finally, agreements should address requirements for the reporting of results of biological screening for active compounds. This allows countries to enforce their rights under a contract and dissuades unfair play.[147]

Additionally, all bioprospecting agreements should have binding provisions regarding licensing and royalties.[148] All products developed from genetic resources obtained under a bioprospecting agreement could potentially earn a royalty and therefore, this aspect should be negotiated and agreed to in advance for obvious reasons.[149]

In keeping with the requirements of technology transfer under the CBD, bioprospecting agreements should also address the requirement that the extracting party provide relevant technological assistance and financing that will assist a source country in commercializing its genetic resources.[150] Likewise, any scientific data obtained during the course of a bioprospecting project should

139. *Id.*
140. *Id.*
141. *Id.*
142. *Id.*
143. *Id.*
144. *Id.*
145. *Id.*
146. *Id.*
147. *Id.*
148. *Id.*
149. *Id.*
150. *Id.*

be freely available to the source country as a product of its genetic property and should be considered in any bioprospecting contract.[151] Bioprospecting agreements should also provide for any specific requirements of the parties regarding stated origin or patenting of newly discovered and developed subject matter.[152]

While this list of important elements is by no means exhaustive, it is a general framework that bioprospecting agreements could generally follow. Although many bioprospecting agreements do not disclose their terms, those that do and that are seen as equitable tend to follow a loose framework similar to that outlined above. This can be illustrated by some of the aspects found in agreements governing various projects funded under the International Cooperative Biodiversity Groups Program (ICBG), a conservation and development effort focusing on developing nations and funded in part by the U.S. government.[153] For instance, the agreements of the ICBG-Peru project address all of the salient points listed above, and provide for equitable benefit sharing through monetary and technological transfer as well as the retaining of local ownership through jointly owned patents on newly discovered compounds.[154] In the event that a commercial product based on the genetic resources of Peru is developed, it is reported that up to 75% of any royalties generated will make their way back to the Peruvian people.[155] Unfortunately, it seems unlikely that all parties and agreements will prove to be as equitable.

III. Perceived Problems

A. International Agreement Shortcomings

Despite the use of such agreements, there appear to be several sticking points that could directly affect bioprospecting and the ownership of genetic resources in the MBRS. These perceived problems are encompassed primarily in international agreement shortcomings, biopiracy, informed consent issues and potential conflicts between TRIPS and the CBD.[156]

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151. *Id.*

152. *Id.*

153. *See generally* McManis, *supra* note 121, at 565-69 (discussing general attributes of ICBG projects); *see also* John E. Fogarty International Center, International Cooperative Biodiversity Groups (2005), http://www.fic.nih.gov/programs/icbg.html (last visited July 14, 2004) (providing ICBG general information).

154. *See* McManis, *supra* note 121, at 573.

155. *Id.*

156. *See* discussion *infra* Part III.D.

In the case of international agreements such as the CBD, there appears to be certain structural defects that have proven to be problematic. One of the most glaring issues is the inconsistency or total lack of rules regarding liability and enforcement of Convention positions.[157] The CBD, like many international agreements, focuses much of its attention on merely identifying problem areas, and then attempting to set generalized goals, policies, and obligations for its member States.[158] Each national government that becomes a signatory to such a treaty is "ultimately responsible for the implementation of the goals of the Convention."[159] It therefore seems plausible that the upholding of Convention provisions will likely rely primarily on a nation's perception of its own self-interest, and to a lesser extent pressure exerted by the international community.[160]

The CBD is designed as an instrument to govern interactions between governments. As such it does not address the notion of individuals bringing causes of action to enforce Convention provisions.[161] Article 27 of the CBD does recognize a cause of action for participating governments in the International Court of Justice (ICJ),[162] but since only states can bring a cause of action in the ICJ, this would logically require both state awareness of a violation, and a willingness to take action to litigate it. It is also worthy of note that even in the event of a complaint to the court, the provisions violated must actually be enforceable against the offending government and in many instances they may not be.[163] While the international dispute resolution mechanism outlined in Article 27 of the CBD is designed to deal with interstate conflicts, there is "no explicit enforcement mechanism or cause of action under the Convention against a government which destroys its own biodiversity."[164] Here again, change in behavior may be largely dependent on national self-interest, due to the fact that the Convention does not provide for punitive actions.[165] The combination

157. Robin L. Scott, *Bio-Conservation or Bio-Exploitation: An Analysis of the Active Ingredients Discovery Agreement between the Brazilian Institution Bioamazonia and the Swiss Pharmaceutical Company Novartis,* 35 GEO. WASH. INT'L L. REV. 977, 995 (2003).

158. *Id.*

159. *Id.*

160. *Id.*

161. Jenks, *supra* note 52, at 656.

162. *Id.*

163. *Id.*

164. *Id.* at 656-57.

165. Scott, *supra* note 157, at 996.

of vague wording within the Convention, local approaches to defining what conservation of biological resources means and lack of measures to force compliance, allows for a great amount of variation in the level of success that can be achieved.[166] As a result, the CBD might simply be ineffective on some fronts, which could undermine the framework upon which some aspects of the MBRP have been built.[167]

B. Biopiracy

Another obstacle in the system is the phenomenon known as biopiracy. Biopiracy is defined as "the commercial development of naturally occurring biological materials, such as plant substances or genetic cell lines, by a technologically advanced country or organization without fair compensation to the peoples or nations in whose territory the materials were originally discovered."[168] Even though the CBD has been signed by a great majority of the world, the absence of laws against misappropriation of biological and genetic resources has left many in the resource-rich developing world open to unauthorized exploitation.[169] The offspring of rich natural resources and limited government control, biopiracy has evolved into an extremely profitable business in South America.[170] It has been estimated that the nations of the Amazon region lose thousands of samples of their biological diversity every year.[171] Meanwhile, the acquisition of bioactive materials that can potentially give rise to important compounds allows the companies that develop such compounds to make billions of dollars.[172] Therefore, it is not very surprising that in the Amazon region, "only narcotics and gun running produce more illegally generated profit than the smuggling of biological samples."[173] Despite the clandestine trappings of biopiracy, in many cases it is researchers and corporations that are the perpetrators, although whether these groups can be considered to be acting criminally is of course debatable.[174] Regardless of culpability, what often occurs is that

166. Jenks, *supra* note 52, at 656-57.
167. *Id.* at 658.
168. Dictionary.com, http://dictionary.reference.com (last visited March 16, 2006) (defining "biopiracy").
169. Commey, *supra* note 133, at 12.
170. Scott, *supra* note 157, at 978.
171. *Id.*
172. *Id.*
173. *Id.* at 979.
174. *Id.*

samples are removed and taken to the developed world, where potentially valuable compounds or gene sequences can be isolated.[175] If such compounds are found, they or the process for reproducing them can then be patented under the TRIPS agreement.[176] This effectively procures a limited monopoly for the entity that appropriated the sample, and returns nothing to the source country from which the sample originated.[177]

To showcase the growing global concern over this phenomenon, the United Nations Commission on Crime Prevention and Criminal Justice saw fit to discuss the issue of illicit trafficking in protected species of wild fauna and flora and illicit access to genetic resources in 2002.[178] The Commission went on to encourage all Member States to "promote judicial cooperation and mutual technical assistance with a view to preventing, combating, and eradicating illicit trafficking in protected species of wild flora and fauna."[179] Additionally, discussions regarding patents on genetic resources, such as medicinal plants, were central to the talks at the seventh meeting of the COP.[180]

Corporations have occasionally appropriated biological resources that have been known for centuries, and examples of biopiracy are not hard to find in the literature. For example, the anti-bacterial and insecticidal properties of the neem tree, a traditional remedy from India,[181] has had over eighty patent applications submitted by corporations from the United States and Japan.[182] In fact, there are dozens of other products from the fauna and flora of developing nations that are already patented by foreign entities.[183] Currently, the United States, Japan, England and France lead the list of countries holding patents on Amazon forest plant products, according to surveys conducted by Brazilian researchers.[184] A most glaring example of biopiracy is reported in a

175. *Id.*
176. *Id.*
177. *Id.*
178. Bruce Zagaris, *UN Commission on Crime Prevention and Criminal Justice Holds 11th Session*, 18 Int'l. Enforcement L. Rep. 298 (2002).
179. *Id.*
180. *See* COP, *supra* note 18.
181. Dinyar Godrej, *8 Things You Should Know About Patents on Life: Dinyar Godrej Gives the Lowdown on Some Underhand Activities,* NEW INTERNATIONALIST, Sept. 2002, *available at* http://www.findarticles.com/p/articles/mi_m0JQP/is_2002_Sept/ai_91751542#.
182. *Id.*
183. Livia Ferrari, *Brazil Loses Patents to Foreigners*, GAZETA MERCANTIL (Brazil), May 17, 2004, at 1.
184. *Id.*

periodical entitled *The New African.* In the December 2003 issue, the periodical tells the story of the Endod plant.[185] The article reports that the University of Toledo has magnanimously offered the government of Ethiopia the opportunity to license the rights necessary to continue research on various reactive properties of the Endod in exchange for $25,000.[186] However, it appears that local Ethiopian knowledge of this particular medicinal plant dates back centuries, and the species has been the focus of much scientific research in the area for a number of years.[187] Apparently, one Ethiopian scientist by the name of Akilu Lemma has actually been awarded an honorary doctorate degree by the University of Toledo for his work in developing the Endod as a possible cure for bilharzia.[188] The University subsequently applied for a patent on the plant, which ultimately resulted in Ethiopia being told it must pay for what it already owned.[189] Needless to say the Ethiopians were less than pleased.[190] These examples illustrate the very real possibility that the rich biodiversity of the MBRS could be equally exploited, thereby undermining the efforts of the participating nations to preserve the value of their genetic resources and ultimately the MBRS itself.[191]

C. Informed Consent

Another related problem is inconsistencies in regard to the prior informed consent that is called for in the CBD.[192] While all informed consent guidelines include some basic elements, what informed consent actually means is somewhat vague.[193] Closer analysis of the term shows how much actually has to be addressed in an effort to comply with the provision.[194] In her article, *You Say Yes, I Say No; Defining Community Prior Informed Consent under the Convention on Biological Diversity*, Laurel Firestone breaks the term into its parts and identifies several areas of concern for each:

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185. *See* Commey, *supra* note 133.
186. *Id.*
187. *Id.*
188. *Id.*
189. *Id.*
190. *Id.*
191. McLaughlin, *supra* note 17.
192. *See generally* Firestone, *supra* note 117 (discussing pros and cons of current informed consent systems).
193. *See id.* at 183.
194. *See id.*

> (1) Prior: What activities require consent? What should be the time frame given for deliberation and negotiations (i.e., how far in advance must PIC be sought)?
> (2) Informed: What information must be provided? In what form should information disclosure take place?
> (3) Consent: Who can give consent? How can negotiations maintain trust and legitimacy? In what form should consent be issued, and how detailed should any statement or agreement be?[195]

While these issues are primarily procedural in nature, there are other considerations as well. Issues such as how many samples may be taken for the purpose requested once permission is attained, and for what purposes the samples may be used come immediately to mind. These factors are also either not well defined or ignored completely in the text of the CBD, and as a result there is great variation in the way they are handled by the nations of the world.[196]

The specified purpose aspect of informed consent sparks another concern, that of unintentional or secondary uses.[197] This raises the question of whether prior informed consent requirements should apply when an invention is developed from substances derived from active compounds that have been previously accessed with permission, and if so, how far should this protection extend.[198]

Despite some efforts to rectify these issues, there will likely always be obstacles in this area. This is because of the difficulty in predicting where a project and its related knowledge may lead,[199] and because in some instances, information can be innocently utilized against the wishes of a source country.[200] Problems can also result from what are usually very disparate relationships between source countries and those that wish to exploit their resources in terms of power and wealth.[201] This can effectively tie the hands of a source country when it comes to granting informed consent, leading to questions as to whether consent can actually ever be truly given under such circumstances.[202]

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195. *Id.* at 185.
196. *Id.*
197. McManis, *supra* note 121, at 563.
198. *Id.*
199. Firestone, *supra* note 117, at 206.
200. *Id.*
201. *Id.*
202. *Id.*

Additionally, there is a potential public relations issue that can arise from the informed consent requirement. Rounding ethical corners through presumed consent that is based on questionable criteria can damage a project by inciting the local population, not to mention attracting the attention of watchdog organizations around the world.[203] The resultant negative publicity could create increased costs, failed investments, and future obstructions to further research.[204]

Finally, consideration should again be given to problems with enforcement of informed consent provisions, whatever their ultimate form.[205] How exactly does one enforce consent provisions? Can offshore corporations ever really be trusted? How does a party know if it has been undermined? What should be the result if a nation or corporation is found to be in noncompliance?

As outlined above, bioprospecting agreements have been hailed as a possible solution to some of these issues.[206] Unfortunately, they also seem to contribute their share of concerns. All bioprospecting agreements by their nature are different.[207] All have strengths and weaknesses, and some are better than others in the way they deal with issues between the parties.[208] This lack of uniformity may in fact be bioprospecting agreements' greatest asset and their greatest liability as well.[209]

The evolution of such contractual arrangements is generally seen as a positive thing.[210] Their very existence acknowledges the right to ownership and control of genetic resources inherent in the CBD.[211] Bioprospecting agreements also have the potential to provide economic enrichment for the source country in the form of shared benefits and technology, which is usually in short supply.[212] Just as important, the developed countries of the North benefit through the commercialization of new products and com-

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203. *See* Jamaica Potts, *At Least Give the Natives Glass Beads: An Examination of the Bargain Made Between Iceland and Decode Genetics with Implications for Global Bioprospecting*, 7 VA. J.L. & TECH. 8, 93-97 (2002) (discussing the impact of ethical issues on bioprospecting projects).

204. *Id.* at 96.

205. Scott, *supra* note 157, at 995 (illustrating the lack of enforcement provisions in the Convention on Biological Diversity).

206. Asebey & Kempenaar, *supra* note 53, at 704.

207. SUNDERLAND ET AL., *supra* note 127.

208. *Id.*

209. *See* Craig Allen Nard, Correspondence, *In Defense of Geographic Disparity*, 88 MINN. L. REV. 222, 236 (2003).

210. *Id.* at 237.

211. *Id.*

212. *Id.*

pounds that would not otherwise have been available.[213]

However, despite their obvious potential, it is not always wine and roses when it comes to bioprospecting agreements. To begin, many bioprospecting agreements can be quite complex.[214] As a result of this complexity, and the relative scarcity of black letter international law on the subject, their terms may fall afoul of various administrative agencies or international agreements that have a finger in the genetic resource pie.[215] For instance, terms of a particular bioprospecting agreement may define or stipulate actions that are governed by separate international agreements, both in and out of the CBD framework, which can cause confusion in both the source and destination countries.[216]

Also troubling is the issue of unequal bargaining power between parties and the lack of a universally accepted mechanism that governs ownership of genetic property rights or the distribution of royalties.[217] The notion that a poor developing country will be able to bargain with sophisticated entities with huge financial and legal resources does not find much purchase in most of the commentary.[218] Furthermore, the terms of nearly all of these agreements are not easily accessible, leading to speculation regarding the potential for inequitable agreements.[219] For instance, the terms concerning royalty payments for access to genetic resources generally remain undisclosed, as they are considered confidential business information.[220] This can obviously lead to difficulty in monitoring the fairness of these deals, and could lead to mistrust on both sides of the debate due to lack of accountability.[221]

D. Conflicts between CBD and TRIPS

Finally, nowhere is friction from the CBD's new approach to genetic property rights more keenly expressed than in perceived conflicts between the CBD and TRIPS.[222] TRIPS is the result of a concerted effort by the members of GATT, as they sought to pro-

213. *Id.*
214. *See* McManis, *supra* note 121, at 573.
215. *Id.* at 559.
216. *Id.*
217. Nard, *supra* note 209, at 236.
218. Asebey & Kempenaar, *supra* note 53, at 724.
219. *Id.*
220. *Id.* at 725.
221. *Id.* at 726.
222. McManis, *supra* note 121, at 547-48.

mote economic growth through the strengthening of international intellectual property protection.[223] As discussed above, the CBD, upon its formation in 1992, called for international conservation, sustainable use, and fair and equitable sharing of benefits arising from biodiversity.[224]

The debates surrounding TRIPS and the CBD primarily revolve around a central set of contentious issues between the North and the South involving certain economic policies.[225] Most of the countries of the North feel that intellectual property rights over genetic materials are a stimulus to economic activity and that the South mistakenly views them as an impediment to the transfer of capital and technology rather than as a prerequisite.[226] The countries of the South, however, feel that patent protection should not include any elements of living organisms.[227] The South is likewise concerned about the possibility of increased biopiracy due to the structure of the TRIPS system.[228] Meanwhile, the United States has maintained that there really is no conflict between TRIPS and the CBD.[229] The head of the U.S. delegation to the Convention is reported to have stated that "the relationship is complementary and not contrary. TRIPS establishes appropriate levels of protection for [intellectual property rights], including patents that can be supportive of the CBD."[230] This U.S. ideal has been disputed by critics such as the Third World Network (TWN), an independent watchdog organization that bills itself as "a non-profit international network of organizations and individuals involved in issues relating to development, the Third World, and North-South issues."[231] A representative of TWN recently cited numerous examples of the negative impacts of intellectual property rights over life forms in developing countries. These included the "grant of patents on genetic resources from developing countries, often without the knowledge and consent of the owners of

223. *Id.* at 548.
224. CBD, *supra* note 24, art 1.
225. McManis, *supra* note 121, at 548.
226. *Id.*
227. *Id.* at 548-49.
228. *Id.* at 549.
229. Gurdial Singh Nijar, *CBD Input to TRIPS Review of Life-Form Patents*, SOUTH-NORTH DEV. MONITOR, July 1999, http://www.twnside.org.sg/title/input-cn.htm (discussing conflicts between the CBD and TRIPS).
230. *Id.*
231. *See generally* THIRD WORLD NETWORK, http://www.twnside.org.sg/twnintro.htm (last visited March 16, 2006) (providing a clearinghouse of information that addresses a host of third world concerns such as trade issues and other North-South conflicts).

the resources; broad-scope patents that limit access to a wide segment of germ plasm; and protection rights claimed by plant breeders over materials deposited in international gene banks."[232] Examples such as patents being granted on food and medicine plants developed from plant varieties originally bred by indigenous people are often mentioned by the countries of the developing world, and the difference of opinion seems far from settled.[233]

While the TRIPS agreement itself does not directly address genetic resources,[234] there does appear to be some support for the U.S. position.[235] Commentators have noted that certain provisions of TRIPS can be read in such a way as to promote the concept of genetic ownership and transfer of technology.[236] For instance, Article 7 stipulates that "[t]he protection and enforcement of intellectual property rights should contribute to the promotion of technological innovation and to the transfer and dissemination of technology, to the mutual advantage of producers and users of technological knowledge and in a manner conducive to social and economic welfare, and to a balance of rights and obligations."[237] The determination that an intellectual property right in unmodified genetic resources exists as called for by the CBD can seemingly be made to fit within this provision.[238] Unfortunately, both sides seem deadlocked on how to proceed.[239]

Despite these seemingly wide divisions, areas of cooperation between the agreements may have begun to take shape.[240] These areas have led some to postulate that the agreements are (or should be) interdependent.[241] The reasoning behind this notion is based on the fact that bioprospecting and research on genetic resources has a high rate of failure.[242] As a result, research interests depend on continuous access to sources of testable materials.[243] On the other hand, many developing countries may not have

232. Nijar, *supra* note 229.

233. Commey, *supra* note 133 (illustrating several examples of biopiracy).

234. Weerawit Weeraworawit, *Formulating An International Legal Protection For Genetic Resources, Traditional Knowledge and Folklore: Challenges for the Intellectual Property System*, 11 CARDOZO J. INT'L & COMP L. 769, 776 (2003).

235. *Id.*

236. *Id.*

237. *Id.* (quoting TRIPS, *supra* note 26, art 7).

238. *Id.*

239. *See* McManis, *supra* note 121, at 550.

240. *Id.*

241. *Id.*

242. *Id.*

243. *Id.*

the incentive to utilize their biodiversity in a sustainable way, which threatens the supply of such materials.[244] The effects of this dependant relationship may ultimately slow the loss of biodiversity in the South as the need for new sources of materials becomes greater and more incentives and assistance, including the fruits of previous genetic research, are provided by the North for sustaining them.[245] In any event, it was hoped that the COP, which convenes every two years, would be able to adequately address some of these issues. Unfortunately, most of their attempts have revolved around resolutions to look into the matter, but little else.[246]

IV. Potential Solutions

A. *Concrete International Standards*

In order for the MBRP to function adequately, the issue of property rights in genetic material will have to be resolved on an international level.[247] Once consensus on this issue is reached, reasonable compensation will likely have to be provided to the South in order to access their genetic wealth.[248] The amount of compensation necessary is difficult to estimate, but the amount will have to be high enough to encourage nations to take an active role in preserving and providing access to their newfound genetic property.[249] Determining this may not be an easy task. For instance, how much are the genetic resources of an expansive reef systems really worth? While the numbers will clearly be tied to potential earnings from the exploitation of such resources, it is nearly impossible to predict the magnitude of future discoveries.[250] Regardless, these issues must be addressed if the CBD and other international conservation efforts such as the MBRP are to function in a practical manner.[251] Additionally, it seems logical that a meaningful liability structure will be needed if international agreements governing genetic resources are to function as they were originally envisioned.[252] With a strong liability structure, the

244. *Id.*
245. *Id.* at 551.
246. *See generally* COP, *supra* note 18 (listing the schedule and text of previous meetings).
247. Weeraworawit, *supra* note 234, at 780.
248. Jenks, *supra* note 52, at 659.
249. *Id.*
250. *Id.* at 660.
251. *Id.*
252. *Id.* at 658 (discussing possible liability structures and their benefits).

countries of the MBRP would be better able to decide how to proceed in optimizing the resources of the MBRS within the framework set up under the CBD. This would be helpful because participating countries would know exactly where they stood, and consequently, would be better able to make rational judgements regarding the shared resources of the MBRS.[253] Additionally, writers have suggested that restitution for infractions on either side of the issue could be a useful method to impose liability.[254] By requiring restitution, the legal system would force those that misuse elements of biodiversity to bear the full cost of their actions, and would act as a significant deterrent to noncompliance.[255] Regardless of which system is ultimately chosen, there remains a glaring "need for a unified internationally accepted approach that ensures consistent enforcement."[256]

A number of developing countries have called for some type of legally binding instrument based on benefit sharing.[257] This instrument could be used to formulate legally binding measures regarding sovereign rights over genetic resources, prior informed consent implementation, clarification of scope, limits and requirements for patents, and other legally binding user measures.[258] Addressing these concerns would clarify the role of user nations in the exchange and would also serve as a safeguard over the rights of source countries.[259]

Another problem that could potentially be solved through the use of concrete international standards is that posed by the use of language such as "mutually agreed terms" found in the provisions of the CBD.[260] Setting minimum standards and definitions for terms to be used in contract negotiations may be helpful in deterring abuse by bioprospecting interests that could attempt to take advantage of the countries of the MBRP, by playing them off against each other in an effort to reduce the cost of access.[261] In an

253. *Id.* at 658-59.

254. *Id.* at 658.

255. *Id.*

256. Elizabeth Longacre, Note, *Advancing Science While Protecting Developing Countries from Exploitation of Their Resources and Knowledge*, 13 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 963, 995 (2003).

257. Ling, *supra* note 16 (discussing benefits of a legally binding instrument governing genetic resources in the relationship between developed and developing nations).

258. *Id.*

259. *Id.*

260. *Id.*

261. *Id.*

effort to avoid such a race to the lowest common denominator, there appears to be a very real need for countries with shared resources to collaborate closely in the development of principles and mechanisms designed to facilitate access to their biodiversity.[262] This collaboration could take several forms. One possibility is for developing countries to seize control of genetic resource markets through the formation of genetic cartels as a response to factors such as inadequate bargaining power or depressed resource values.[263] Other possible actions, including voluntary regional coordination such as that exhibited by the nations of the MBRP, take the middle ground and have been reported to be the most likely form of future action.[264] In this form, concerted action can result when countries with viable sources of genetic resources negotiate an agreement governing bioprospecting rules and regulations, as well as the sharing of benefits and technology transfer.[265] This type of arrangement, though dependent on the provisions of the CBD for their legitimacy, could serve to mitigate the shortfalls of the CBD and allow organizations like the MBRP to generate revenue.[266]

However, there are also drawbacks to these approaches. One disadvantage to cartels can be found in provisions of the CBD that require source nations to provide access for environmentally friendly uses of biodiversity.[267] Again, vague wording makes it unclear how far nations could go in their restriction of access, and still remain a part of the Convention.[268] It seems likely however that such blurry meanings will be more of a help than a hindrance when it comes to unilateral Southern action.[269] It seems worthy of note that many of the signatories to the CBD are source nations of the South, and ultimately it may be their interpretation of the provisions that matter.[270]

B. Biopiracy Solutions

As outlined above, biopiracy could have an important impact on the value of genetic resources in the developing countries of the

262. *Id.*
263. Asebey & Kempenaar, *supra* note 53, at 737-38.
264. *Id.* at 739.
265. *Id.*
266. *Id.* at 746.
267. *See* CBD, *supra* note 24, arts 15-16.
268. Asebey & Kempenaar, *supra* note 53, at 746.
269. *Id.*
270. *Id.*

MBRS.[271] Potential solutions to suppress such biopiracy are often based on amending current intellectual property law and patent requirements.[272] At its twenty-sixth session, the WIPO General Assembly established an Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore in late 2000.[273] The tasks the committee were to take up included "the development of 'guide contractual practices' and model intellectual property clauses for contractual agreements on providing for access to genetic resources and benefit-sharing,"[274] as well as the development of appropriate international patent rules that could address such issues as biopiracy and prior informed consent.[275]

Meanwhile, the CBD has also identified intellectual property issues as being of great importance to the debate. These include "the use of intellectual property rights as a mechanism 'to support, in user countries, prior informed consent requirements in provider countries;' and . . . the recording of interests in inventions that arise from access to or use of genetic resources."[276] Writers on the subject have likewise proposed that the origin of genetic resources and documentation of prior informed consent should be required indications on patent applications in an effort to thwart biopiracy.[277]

Trade secrets have also been posited as a potential way to protect genetic resources from biopiracy.[278] Trade secrets are normally licensed to someone in return for both royalties and assurances of confidentiality.[279] Trade secrets may include "any formula, pattern, device, or compilation of information which is used in one's business, which gives [that person] an opportunity to obtain an advantage over competitors who do not know or use it."[280] The virtual monopoly created by this secrecy is the motiva-

271. Commey, *supra* note 133.

272. Longacre, *supra* note 256, at 995.

273. McManis, *supra* note 121, at 557-58.

274. *Id.* at 558.

275. *Id.*

276. *Id.* at 563 (quoting WORLD INTELL. PROP. ORG., MATTERS CONCERNING INTELLECTUAL PROPERTY AND GENETIC RESOURCES, TRADITIONAL KNOWLEDGE AND FOLKLORE - AN OVERVIEW 15 (2001), *available at* http://www.wipo.int/documents/en/meetings/2001/igc/pdf/grtkfic1_3.pdf).

277. Longacre, *supra* note 256, at 999.

278. *Id.* at 997.

279. *Id.*

280. *Id.* (quoting CRAIG JOYCE ET AL., COPYRIGHT LAW 11 (5th ed. 2001)).

tion for this approach.[281] While trade secrets are attractive in many ways, the requirements of secrecy and meticulous stewardship of this knowledge may prove difficult for a developing nation and its people, who may be ill prepared to deal with industrial espionage while consumed with the business of eking out a living in a remote sector of the world.[282] Also, traditional knowledge of medicinal organisms is usually known to the public in these remote areas, and would therefore never truly be a secret.[283] In addition, like all other areas of intellectual property law, trade secret law is inconsistent from place to place at present, and will likely remain so for some time, TRIPS notwithstanding.[284]

Insofar as the MBRP nations are concerned, the most promising direction may be the hope of altering international patent regimes to reflect the origin of genetic resources that give rise to new inventions.[285] While this seems attractive to many in the South, the idea has made little headway in an international community that is divided on the subject.[286] A questionnaire sent out by the Working Group on Biotechnology of WIPO to its members highlights this finding.[287] Out of fifty responding countries, only five responded positively to the question: "does your legislation include any special provisions to ensure the recording of contributions to inventions (such as the source of government funding, the source of generic resources that originate or are employed in biotechnological inventions, the grant of prior informed consent to have access to those resources, etc.)?"[288] Thirty-five of the responding countries also stated that they had no plans to enact such legislation in the future.[289]

C. Informed Consent Protections

Altering patent regimes can likewise play an important role in the area of informed consent.[290] Once again however, international players have yet to come to terms with many of these issues.[291] However, a former WTO official by the name of Dr. Nuno

281. *Id.*
282. *Id.* at 998.
283. *Id.*
284. *Id.*
285. *Id.* at 999.
286. *See* Weeraworawit, *supra* note 234, at 778.
287. *Id.*
288. *Id.*
289. *Id.*
290. McManis, *supra* note 121, at 564.
291. *Id.*

Pires de Carvalho has explored tinkering with the patent regime as a mechanism to support prior informed consent.[292] Dr. Carvalho has concluded that, "although requiring disclosure of origin and evidence of prior informed consent as a condition for obtaining patent protection would be inconsistent with current TRIPS standards, such a requirement could nonetheless be made a condition for enforcement of patent rights, utilizing well established equitable doctrines of unclean hands and fraudulent procurement."[293] This approach has many exciting possibilities. Dr. Carvalho points out that in most cases, issues of non-compliance with established informed consent standards would only be discovered when enforcement of the patent was sought.[294] This contrasts the approach outlined above, by forcing most non-compliance efforts to be focused on enforcement, rather than on the application process.[295] Due to this focus on enforcement, authorities will be able to examine non-compliant behavior in light of informed consent requirements, but would only do so for those patents that have enough economic potential to warrant litigation and enforcement.[296] This could save resources and have the effect of streamlining the process.[297] Basically, if a party did not follow the proscribed rules, it might not be able to keep the patents it happened to obtain. However if the patent had little value, the issue would be moot until such time as it did become worthwhile to enforce.[298] Doctor Carvalho also notes that an approach of this nature would also allow enforcement to occur in an infringement tribunal that could potentially levy remedial damages to the affected party, further strengthening the desire to comply with the provisions of international agreements.[299]

Regardless of which philosophy is followed, the CBD sets out that prior informed consent should only apply to specific purposes and activities under which access was granted.[300] As a result, the provisions of the CBD infer that additional permissions must be obtained for additional uses of these genetic resources.[301] Obvious problems exist in this regard however. As outlined above, it is

292. *Id.*
293. *Id.*
294. *Id.*
295. *Id.* at 564-65.
296. *Id.* at 565.
297. *Id.*
298. *Id.*
299. *Id.*
300. CBD, *supra* note 24, art. 15.
301. Firestone, *supra* note 117, at 184.

often difficult to predict such matters.[302] In order to combat this problem, it may become necessary to outline specific policies that utilize a proximate cause type of analysis for secondary and tertiary processes that may be derived from previously accessed genetic resources.[303] One would hope that the creation of any kind of binding rules would at least promote the needed stability that this type of international negotiating system usually requires. India has taken a leading step in the area with the creation of its Biodiversity Diversity Act.[304] This act standardizes the process by identifying several specific uses of genetic resources in which the using party must obtain prior informed consent.[305]

There are of course competing concerns, and because they are significant, they warrant a cautionary note. There is a significant school of thought that suggests that enforcement of intellectual property rights and informed consent requirements will ultimately raise expenses associated with bioprospecting, as developing nations would likely gain in bargaining power as a result.[306] Under such circumstances, policy makers could be forced to weigh the everyday needs of their people against the claimed property rights of various parties.[307] While it does appear likely that solving the problem one way or the other is really what is in the best interest of mankind, it is important to note that due to the positive impact that bioprospectors and biopirates have on the food and medicine supplies of the world, it may be difficult to convince policymakers to sanction their activities.[308]

Finally, effective enforcement outside of the patent regime is also likely warranted.[309] Source nations will have to take steps on their own to punish non-compliance with informed consent guidelines,[310] and may even have to go so far as to include criminal sanctions against the offenders.[311]

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302. McManis, *supra* note 121, at 563.

303. Firestone, *supra* note 117, at 184.

304. *See* the Biological Diversity Act, 2002, No. 18 of 2003; India Code (2003), *available at* http://indiacode.nic.in/fullact1.asp?tfnm=200318.

305. Firestone, *supra* note 117, at 184.

306. Paul J. Heald, *The Rhetoric of Biopiracy*, 11 CARDOZO J. INT'L & COMP. L. 519, 531-32 (2003).

307. *Id.* at 532.

308. *Id.*

309. Firestone, *supra* note 117, at 204-05.

310. *Id.* at 204.

311. *Id.*

D. Effective Use of Bioprospecting Agreements

Once again, bioprospecting agreements may have potential as a force for stabilization in the area of informed consent requirements.[312] In order to avoid problems that could arise in the context of such agreements, WIPO has produced a document entitled "Operational Principles for Intellectual Property Clauses of Contractual Agreements Concerning Access to Genetic Resources and Benefit-Sharing."[313] This document provides examples of standard clauses and contractual provisions that would be useful in defining such things as scope of contract, intellectual property rights and obligations of both providers and recipients of genetic resources, as well as dispute resolution.[314] WIPO has continued to look into solutions for these types of problems, and has also gone so far as to discuss possible formats for a centralized database of contractual items "relating to intellectual property, access to genetic resources and benefit-sharing."[315]

While standardizing contractual terminology and structure may have many advantages to the countries of the MBRP, it is important to note that bioprospecting is primarily a scientific research endeavor, and there is never a guarantee of success.[316] As a result it may be also be important to allow some flexibility in rules governing access to genetic resources in order to avoid suppressing the desire to conduct what could be invaluable scientific research.[317]

Another advantage that could possibly be realized through the effective use of bioprospecting agreements is that of tethering.[318] Tethering requires bioprospectors to perform at least part of the research and development of a country's genetic resources within that host country.[319] For instance, Iceland has required that deCODE Genetics Corporation keep much of its genetic database research and development inside the country.[320] This forces the company to contribute to the local economy, creates a demand for a technically proficient workforce, and provides

312. Commey, *supra* note 133.
313. McManis, *supra* note 121, at 559.
314. *Id.*
315. *Id.* at 560.
316. *Id.* at 568.
317. *Id.*
318. *See generally* Potts, *supra* note 203, at 88-93 (discussing the use of tethering and its advantages to host countries).
319. *Id.* at 88.
320. *Id.* at 89.

employment and business opportunities for workers that already posses scientific skills.[321] The MBRP could potentially benefit from such tethering practices as a way to diversify and stimulate the economy of the region, which could lead to growth and increased prosperity for these developing areas.[322] Tethering can also contribute to enforcement of genetic rights for the countries of the MBRP. Keeping research activities within arms reach and having them performed to some extent by local workers would likely improve a nation's ability to police the use of its genetic resources with regard to informed consent and sharing of benefits arising from that research.[323]

V. CONCLUSION

In conclusion, the MBRP has great potential as a force for both the conservation of marine resources and scientific advancement in the Americas. Unfortunately, the MBRP is also vulnerable to problems inherent in the conflicting regimes governing the ownership and control of its greatest assets, and this has the potential to undermine the success of the initiative.

Through the acceptance of genetic ownership on an international level, coupled with the effective use of standardized bioprospecting agreements and international cooperation in the area of enforcement, the MBRP could easily become an international benchmark in the area of genetic conservation, harvesting and research. Such an arrangement could prove to be extremely beneficial to the developed world, which would gain a stable storehouse of genetic material, as well as the countries of the MBRP, which could easily find themselves the stewards of a perpetual source of revenue and development. With continued efforts on all fronts, it can only be hoped that both sides of the North-South division will someday come to realize that their interdependence and the MBRP goals of genetic conservation and sustainable use can be realized.

321. *Id.* at 90.
322. *See id.*
323. *Id.* at 91.